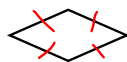


8-4 Properties of Rectangles, Rhombuses and Squares

Rectangle--parallelogram with 4 right angles



Rhombus--parallelogram with 4 congruent sides



Square--parallelogram with 4 right angles and 4 congruent sides

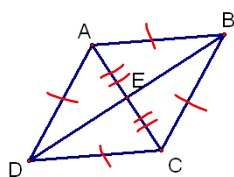


Corollaries

Rhombus Corollary--A quadrilateral is a rhombus iff it has 4 congruent sides.

Rectangle Corollary--A quadrilateral is a rectangle iff it has 4 right angles.

Square Corollary--A quadrilateral is a square iff it is a rhombus and a rectangle.



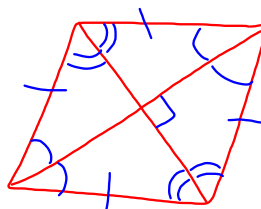
Rhombus ABCD

Prove: $\overline{AC} \perp \overline{DB}$

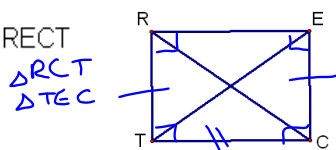
- | | |
|--|--|
| <p>① $\overline{AB} \cong \overline{BC}$</p> <p>② $\overline{AE} \cong \overline{EC}$</p> <p>③ \overline{BE} is \perp bis. of \overline{AC}</p> <p>④ $\overline{AC} \perp \overline{DB}$</p> | <p>① Given</p> <p>② def. of Rhombus</p> <p>③ diagonals of \square bis. each other</p> <p>④ Conv. of \perp bis. Thm</p> <p>⑤ def of \perp bis.</p> |
|--|--|

Theorem 8.11--A parallelogram is a rhombus iff its diagonals are perpendicular

Theorem 8.12--A parallelogram is a rhombus iff each diagonal of a rhombus bisects a pair of opposite angles

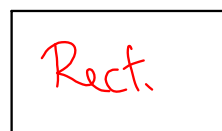
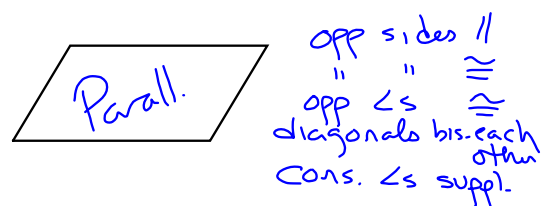
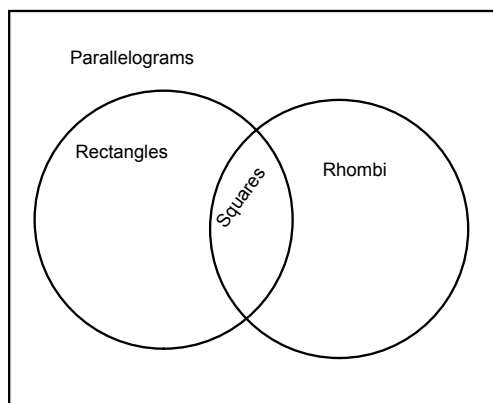


Given: Rectangle RECT

Prove: $\overline{RC} \cong \overline{TE}$ 

St.	Reasons
① $\angle RTC + \angle TCE$ are Rt \angle s	① Given
② $\angle RTC \cong \angle TCE$	② def of Rectangle
③ $\overline{RT} \cong \overline{EC}$	③ Rt. $\angle \cong$ thm
④ $\overline{TC} \cong \overline{TC}$	④ Opp. sides of \square are \cong
⑤ $\triangle RTC \cong \triangle ECT$	⑤ Refl.
⑥ $\overline{RC} \cong \overline{ET}$	⑥ SAS
	⑦ CACTC

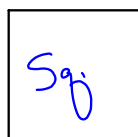
Theorem 8.13--A parallelogram is a rectangle iff its diagonals are congruent.



5 \square facts
4 Rt \angle s
diagonals \cong



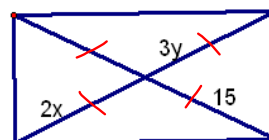
- 5 facts
- 4 \cong sides
- diagonals \perp
- diagonals bis. \angle s



- 5
everything

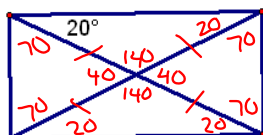
Examples:

Given the rectangle below, solve for x and y.



$$\begin{aligned} 2x &= 15 \\ x &= 7.5 \end{aligned} \quad \begin{aligned} 3y &= 15 \\ y &= 5 \end{aligned}$$

Given the rectangle below, fill in all of the angles.



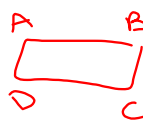
Is ABCD a rectangle?

A(-2, 1)

B(4, 3)

C(5, 0)

D(-1, -2)



\overline{AC} M $(\frac{3}{2}, \frac{1}{2})$

\overline{BD} M $(\frac{3}{2}, \frac{1}{2})$



① Is it a \square ?
(midpt)

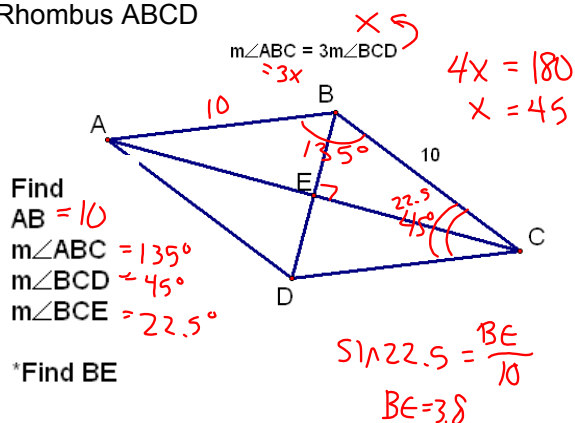
② Check
Is it a Rect?
(diag. \cong)

$$AC = \sqrt{7^2 + 1^2} = \sqrt{50}$$

$$BD = \sqrt{5^2 + 5^2} = \sqrt{50}$$

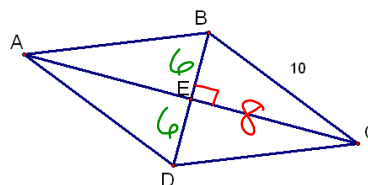
\cong diagonals
 \therefore it is a Rectangle

Rhombus ABCD



Rhombus ABCD

AC = 16



Is $\square ABCD$ a rectangle, rhombus, or a square. List all that apply.

1. A(-7, 3) B(-2, 3) C(1, 7) D(-4, 7)

Check diagonals

\cong Rect
 \perp Rhomb \rightarrow square

$\overline{AC} \text{ } m = \frac{7-3}{1-(-7)} = \frac{4}{8} = \frac{1}{2}$

$AC = \sqrt{8^2 + 4^2} = \sqrt{80}$

$\overline{BD} \text{ } m = \frac{7-3}{-4-(-2)} = \frac{4}{-2} = -2$

$BD = \sqrt{(-2)^2 + 4^2} = \sqrt{20}$

diagonals $\perp \rightarrow$ Rhombus
 diagonals \neq

Is $\square ABCD$ a rectangle, rhombus, or a square. List all that apply.

2. A(-2, -1) B(-4, 3) C(1, 5) D(3, 1)

HW

p537-538

#s 1-14, 19-24, 32-49

50 & 51 (don't find perimeter)

no reason

This is not as much as it seems.